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[PDF] EXPERIMENTAL AND THEORETICAL ANALYSIS OF ROLLER CONE BIT ...

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... Several roller bit models has been presented in past. Since cone rotation speed

was assumed to be constant in most of these models (Eronini, 1982, Ma and Azar ...

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Maxie Backsie Ma Roller

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bibliography

... OMG Object Model drafts, OMG Architecture Guide, Maynard, MA, Object Management Group ... The IADC Roller Bit Classification System, IADC/SPE 23937, February 1992. ... www.posc.org/Specifications/Epicentre V30/ Misc/bibliography.html - 15k - Cached - Similar pages

SOFIA - Interplay of Late Cenozoic Siliciclastic Supply and ...

... and 10.44 Ma (Fig. 2, Fig. 5; Table 1), geologic cross section AA' showing new coreholes and one pre-study well drilled with conventional roller-bit used in ... sofia.usgs.gov/publications/papers/ interplay_platform/seismicseq.html - 23k - Cached - Similar pages

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... the last two tracks aren't all that i'm still going to buy it because i'ma big rolodex fan, but the dragon EP and ... its a roller bit acidic init [05/10/03 20:53:00 ... www.breakbeat.co.uk/interact/comments/ trackcomments.asp?trackID=6781 - 53k - Cached - Similar pages

DCD Chain Tensioner Reviews, Specs and Shopping

... t take into account that chainstay (what it mounts on) is not in-line with the chain; therefore the chain roller bit is all ... I'ma trials rider, and i love it. ... www.mtbreview.com/reviews/Chain_Accessories/ product_20661.shtml - 101k - Cached - Similar pages

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... GeoSyntec Consultants: Guelph, Ontario 1, Atlanta, GA 2, and Boston, MA 3; EnviroMetal ... a cased borehole that had been cleaned and washed using a roller-bit. ... www.containment.fsu.edu/cd/content/pdf/259.pdf - Similar pages

minergynews.com - The most reliable news on Mines and Energy

... S. Kramadibrata, MA Rai, S. Darmawan, and I. Arif. ... Pilot hole drilling was based on rotational methods using a tricone roller bit of 11 inch diameter. ... www.minergynews.com/opinion/athens.shtml - 32k - Cached - Similar pages

The Mane Street -> Emilee And Tahoe

... on the bit and stick his nose on the ground) We have been switching him 3 days on each of two bits, one is the new pessoa roller bit, and the ... Di'ma proud mom ... www.themanestreet.com/forums/index.php?showtopic=6918 - 56k - Cached - Similar pages

... TOTAL Q'TY, 6, 11, 15, 18. WEIGHT (kg), 3500, 5500, 8000, 11000. 4. ??

? ??. ?????? ROLLER BIT ????(?0311621?, 2001.9.26). ...

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Page 1. Appendix 1. Letter from Department of the Environment Blue Creek

to Orange Walk Town Highway Rehabilitation Project EIA Appendix ...

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CLASS 175 BORING OR PENETRATING THE EARTH

1	WITH SEISMIC SHOCK GENERATING
2	BORING WITH EXPLOSION IN INACCESSIBLE
	HOLE
3	. Severing formed core by explosion
3.5	. Explosive charge carried by projectile
4	 Driving core receiver by explosion or with receptacle collecting material in bore
4.5	. Directing successive projectiles or charges in same path
4.51	. With position orienting or indicating
4.52	. With wall engaging packer or anchor
4.53	 Firing chamber movable in bore relative to carrier or another firing chamber
4.54	. With bore condition firing control, or compensating means
4.55	. Independent firing of plural charges
4.56	. Firing control mechanically actuated in bore
4.57	. Projectile forms bore
4.58	With means to initially restrain projectile for pressure build-up
4.59	With means to prevent preliminary bore fluid contact
4.6	. Concave-shaped charge
5	BORING A SUBMERGED FORMATION
6	. Boring with underwater tool drive prime mover
7	 Boring from floating support with submerged independent anchored guide base
8	. Boring from submerged buoyant support
9	. Boring from nonbuoyant support
10	. Boring with submersible vertically movable guide
11	BORING BY DIRECTLY APPLYING HEAT TO FLUIDIZE OR COMMINUTE
12 .	. Combustion of the formation material
13	. With introduction of slag forming flux
14	. Combustion is confined chamber having restricted discharge orifice
15	. Rotating the heating tool
16	. Electrically produced heat
17	WITH HEATING OR COOLING (1) WITHIN THE BORE, OR (2) DRILLING FLUID
18	ICE BORING
19	BORING WITHOUT EARTH REMOVAL (I.E., COMPACTING EARTH FORMATION)
20	. Combined with earth removal (e.g., removing sample)
21	. Fluid passage to exterior of drive point

22	 Drive point detached from shaft to form cased bore or with installation of casing
23	Drive point retracted through shaft or casing
24	AUTOMATIC CONTROL
25	. Of fluid pressure below ground
26	. Of boring means including a below-ground drive
26	prime mover
27	. Of advance or applied tool weight
38	. In response to drilling fluid circulation
39	WITH BIT WEAR SIGNAL GENERATING
40	WITH SIGNALING, INDICATING, TESTING OR MEASURING
41	. Ray energy detection or measuring
42	. Indicating agent released in drilling fluid
44	 Providing identifiable indication of core position in situ for core sample orientation
45	. Tool position direction or inclination measuring or indicating within the bore
46	 Signaling or indicating condition of cutting in cuttings retainer
48	 Measuring or indicating drilling fluid (1) pressure, or (2) rate of flow
49	. Transparent inspection feature
50	 Indicating, testing or measuring a condition of the formation
51	WITH SELF-ACTING CYCLIC ADVANCE AND
	RETRACTION OF TOOL OR TOOL SHAFT
52	
52 53	RETRACTION OF TOOL OR TOOL SHAFT WITH MAGAZINE FOR SUCCESSIVELY MOVING UNCONNECTED, ORIENTED TOOL OR SHAFT SECTIONS
	RETRACTION OF TOOL OR TOOL SHAFT WITH MAGAZINE FOR SUCCESSIVELY MOVING UNCONNECTED, ORIENTED TOOL OR SHAFT SECTIONS TO USE POSITION ENLARGEMENT OF EXISTING PILOT THROUGHBORE REQUIRING ACCESSIBILITY TO EXISTING OPPOSITE BORE ENDS TO INSERT AND REMOVE TOOL BORING BY BELOW GROUND RECIRCULATION
53	RETRACTION OF TOOL OR TOOL SHAFT WITH MAGAZINE FOR SUCCESSIVELY MOVING UNCONNECTED, ORIENTED TOOL OR SHAFT SECTIONS TO USE POSITION ENLARGEMENT OF EXISTING PILOT THROUGHBORE REQUIRING ACCESSIBILITY TO EXISTING OPPOSITE BORE ENDS TO INSERT AND REMOVE TOOL
53 54	RETRACTION OF TOOL OR TOOL SHAFT WITH MAGAZINE FOR SUCCESSIVELY MOVING UNCONNECTED, ORIENTED TOOL OR SHAFT SECTIONS TO USE POSITION ENLARGEMENT OF EXISTING PILOT THROUGHBORE REQUIRING ACCESSIBILITY TO EXISTING OPPOSITE BORE ENDS TO INSERT AND REMOVE TOOL BORING BY BELOW GROUND RECIRCULATION OF UNSUPPORTED ELEMENTS (E.G., SHOT) TOOL ACTUATION BY REACTION OF ROTATING
53 54 55	RETRACTION OF TOOL OR TOOL SHAFT WITH MAGAZINE FOR SUCCESSIVELY MOVING UNCONNECTED, ORIENTED TOOL OR SHAFT SECTIONS TO USE POSITION ENLARGEMENT OF EXISTING PILOT THROUGHBORE REQUIRING ACCESSIBILITY TO EXISTING OPPOSITE BORE ENDS TO INSERT AND REMOVE TOOL BORING BY BELOW GROUND RECIRCULATION OF UNSUPPORTED ELEMENTS (E.G., SHOT) TOOL ACTUATION BY REACTION OF ROTATING ECCENTRIC MASS NATURAL VIBRATION CHARACTERISTIC OF AN ELEMENT OF BORING MEANS RELATED (1) TO NATURAL VIBRATION CHARACTERISTIC OF ANOTHER ELEMENT,
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53 54 55 56 .	RETRACTION OF TOOL OR TOOL SHAFT WITH MAGAZINE FOR SUCCESSIVELY MOVING UNCONNECTED, ORIENTED TOOL OR SHAFT SECTIONS TO USE POSITION ENLARGEMENT OF EXISTING PILOT THROUGHBORE REQUIRING ACCESSIBILITY TO EXISTING OPPOSITE BORE ENDS TO INSERT AND REMOVE TOOL BORING BY BELOW GROUND RECIRCULATION OF UNSUPPORTED ELEMENTS (E.G., SHOT) TOOL ACTUATION BY REACTION OF ROTATING ECCENTRIC MASS NATURAL VIBRATION CHARACTERISTIC OF AN ELEMENT OF BORING MEANS RELATED (1) TO NATURAL VIBRATION CHARACTERISTIC OF ANOTHER ELEMENT, OR (2) TO FREQUENCY OF AN IMPOSED MOTION PROCESSES
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53 54 55 56	RETRACTION OF TOOL OR TOOL SHAFT WITH MAGAZINE FOR SUCCESSIVELY MOVING UNCONNECTED, ORIENTED TOOL OR SHAFT SECTIONS TO USE POSITION ENLARGEMENT OF EXISTING PILOT THROUGHBORE REQUIRING ACCESSIBILITY TO EXISTING OPPOSITE BORE ENDS TO INSERT AND REMOVE TOOL BORING BY BELOW GROUND RECIRCULATION OF UNSUPPORTED ELEMENTS (E.G., SHOT) TOOL ACTUATION BY REACTION OF ROTATING ECCENTRIC MASS NATURAL VIBRATION CHARACTERISTIC OF AN ELEMENT OF BORING MEANS RELATED (1) TO NATURAL VIBRATION CHARACTERISTIC OF ANOTHER ELEMENT, OR (2) TO FREQUENCY OF AN IMPOSED MOTION PROCESSES . Sampling of earth formations Retaining fluid or taking separate fluid sample
53 54 55 56 . 57 58 59 60	RETRACTION OF TOOL OR TOOL SHAFT WITH MAGAZINE FOR SUCCESSIVELY MOVING UNCONNECTED, ORIENTED TOOL OR SHAFT SECTIONS TO USE POSITION ENLARGEMENT OF EXISTING PILOT THROUGHBORE REQUIRING ACCESSIBILITY TO EXISTING OPPOSITE BORE ENDS TO INSERT AND REMOVE TOOL BORING BY BELOW GROUND RECIRCULATION OF UNSUPPORTED ELEMENTS (E.G., SHOT) TOOL ACTUATION BY REACTION OF ROTATING ECCENTRIC MASS NATURAL VIBRATION CHARACTERISTIC OF AN ELEMENT OF BORING MEANS RELATED (1) TO NATURAL VIBRATION CHARACTERISTIC OF ANOTHER ELEMENT, OR (2) TO FREQUENCY OF AN IMPOSED MOTION PROCESSES Sampling of earth formations Retaining fluid or taking separate fluid sample Transporting sample to surface by fluid
53 54 55 56 57 58 59 60 61	RETRACTION OF TOOL OR TOOL SHAFT WITH MAGAZINE FOR SUCCESSIVELY MOVING UNCONNECTED, ORIENTED TOOL OR SHAFT SECTIONS TO USE POSITION ENLARGEMENT OF EXISTING PILOT THROUGHBORE REQUIRING ACCESSIBILITY TO EXISTING OPPOSITE BORE ENDS TO INSERT AND REMOVE TOOL BORING BY BELOW GROUND RECIRCULATION OF UNSUPPORTED ELEMENTS (E.G., SHOT) TOOL ACTUATION BY REACTION OF ROTATING ECCENTRIC MASS NATURAL VIBRATION CHARACTERISTIC OF AN ELEMENT OF BORING MEANS RELATED (1) TO NATURAL VIBRATION CHARACTERISTIC OF ANOTHER ELEMENT, OR (2) TO FREQUENCY OF AN IMPOSED MOTION PROCESSES Sampling of earth formations Retaining fluid or taking separate fluid sample Transporting sample to surface by fluid Boring curved or redirected bores
53 54 55 56 57 58 59 60 61 62	RETRACTION OF TOOL OR TOOL SHAFT WITH MAGAZINE FOR SUCCESSIVELY MOVING UNCONNECTED, ORIENTED TOOL OR SHAFT SECTIONS TO USE POSITION ENLARGEMENT OF EXISTING PILOT THROUGHBORE REQUIRING ACCESSIBILITY TO EXISTING OPPOSITE BORE ENDS TO INSERT AND REMOVE TOOL BORING BY BELOW GROUND RECIRCULATION OF UNSUPPORTED ELEMENTS (E.G., SHOT) TOOL ACTUATION BY REACTION OF ROTATING ECCENTRIC MASS NATURAL VIBRATION CHARACTERISTIC OF AN ELEMENT OF BORING MEANS RELATED (1) TO NATURAL VIBRATION CHARACTERISTIC OF ANOTHER ELEMENT, OR (2) TO FREQUENCY OF AN IMPOSED MOTION PROCESSES . Sampling of earth formations Retaining fluid or taking separate fluid sample Transporting sample to surface by fluid . Boring curved or redirected bores . Boring horizontal bores . Chemical reaction with earth formation or drilling
53 54 55 56 57 58 59 60 61 62 64	RETRACTION OF TOOL OR TOOL SHAFT WITH MAGAZINE FOR SUCCESSIVELY MOVING UNCONNECTED, ORIENTED TOOL OR SHAFT SECTIONS TO USE POSITION ENLARGEMENT OF EXISTING PILOT THROUGHBORE REQUIRING ACCESSIBILITY TO EXISTING OPPOSITE BORE ENDS TO INSERT AND REMOVE TOOL BORING BY BELOW GROUND RECIRCULATION OF UNSUPPORTED ELEMENTS (E.G., SHOT) TOOL ACTUATION BY REACTION OF ROTATING ECCENTRIC MASS NATURAL VIBRATION CHARACTERISTIC OF AN ELEMENT OF BORING MEANS RELATED (1) TO NATURAL VIBRATION CHARACTERISTIC OF ANOTHER ELEMENT, OR (2) TO FREQUENCY OF AN IMPOSED MOTION PROCESSES Sampling of earth formations Retaining fluid or taking separate fluid sample Transporting sample to surface by fluid Boring curved or redirected bores Boring horizontal bores Chemical reaction with earth formation or drilling fluid constituent

68	Anti-agglomeration treatment of gaseous drilling fluid
69	. Combined liquid and gaseous fluid
70	. Plural distinguishable liquids
	. Gaseous fluid or under gas pressure
71	. Prevention of lost circulation or caving
72	3
73	MEANS TRAVELING WITH TOOL TO CONSTRAIN TOOL TO BORE ALONG CURVED PATH
74	. Sectional guide or shaft having means to lock sections in angular relation while boring
75	. Normally curved guide or shaft
76	. Axially spaced opposed bore wall engaging guides
77	SIDE WALL TOOL FED LATERALLY WITHOUT ROTATION FROM INACCESSIBLE HOLE
78	MEANS CARRIED BY HOUSING INSERTABLE IN INACCESSIBLE HOLE TO ADVANCE SIDE WALL TOOL LATERALLY
79	TOOL SHAFT ADVANCED RELATIVE TO GUIDE INSERTABLE IN INACCESSIBLE HOLE TO CHANGE DIRECTION OF ADVANCE
80	. Tool telescopes over guide having surface set at angle in hole
81	. With anchor for guide engaging hole side wall
82	. Guide carried by shaft to operative position
83	With clutch means acting between shaft and guide
84	WITH ABOVE-GROUND CLEANER FOR BORING MEANS
85	WITH ORIENTING OR RACKING MEANS FOR UNCONNECTED TOOLS OR SECTIONS OF SHAFT OR CASING
86	WITH BELOW-GROUND PERSONAL ACCOMMODATION
87	CONVERTIBLE
88	WITH MEANS CARRYING CUTTINGS LATERALLY OF BORE AXIS COMPRISING (1) CHUTE, (2) CONVEYER, OR (3) VEHICLE
89	TOOL ELEMENT OR CONTINUOUSLY DRIVEN FLEXIBLE OR ARTICULATED ENDLESS MEMBER
90	. Flexible or articulated member carried on support swingable or laterally movable relative to bore axis
91	BORING MEANS INCLUDING A CONTINUOUSLY ROTATING BIT DESCRIBING A NONCIRCULAR CROSS-SECTIONAL BORE
92	WITH BELOW-GROUND TOOL DRIVE PRIME MOVER
93	. Below-ground (1) generation of motive fluid, or (2) storage of motivating energy
94	. With below-ground feed means
95	. Plural below-ground drive prime movers
96	. Plural cutter elements driven by individual prime movers
97	. With means to anchor prime movers support to bore wall

98	Expansible anchor
99	Fluid-operated
100	. Discharge passage for motive fluid directed toward bore entrance
101	. With positive connection between tool and
	support shaft for rotary below ground motor
102	. With below-ground conveyer or impeller for
	removal of cuttings
103	. With above-ground means
104	Electric
105	. Reciprocating
106	. With mechanical motion-converting means
107	. Fluid rotary type
108	COMMON DRIVE OR ADVANCING MEANS FOR CONCURRENTLY BORING ALONG LATERALLY SPACED AXES
113	WITH MEANS TO SIMULTANEOUSLY FEED AND ROTATE TOOL FROM A SINGLE MECHANICAL ELEMENT
114	. Constant rotation rate permitted regardless of
	(1) release of feed force, or (2) change in feed rate
118	. With feed anchor in earth wall being bored
121	. Rotary drive for relatively advancing feed screw
122	WITH MEANS TO FEED DRIVE
135	WITH ABOVE-GROUND MEANS TO IMPACT AN EARTH-PENETRATING MEANS
161	WITH ABOVE-GROUND MEANS TO MOVE TOOL TO A DUMPING LOCATION OFFSET FROM BORE
162	WITH ABOVE-GROUND MEANS TO FEED TOOL
170	WITH TOOL DRIVE PRIME MOVER OR ABOVE- GROUND MECHANICAL MOTION CONVERTING DRIVE MEANS
171	. With installing casing
172	. With endless flexible conveyer
173	. With diversely operated shafts extending into bore
189	. Drive reciprocates tool
195	. Rotary drive for a relatively advancing tool (e.g., rotary table)
202	ABOVE-GROUND MEANS FOR RELATIVELY MOVING BELOW-GROUND TOOL ELEMENTS
203	WITH ABOVE-GROUND MEANS TO ADVANCE OR RETRACT BORING MEANS
205	WITH MEANS PROVIDING PRESSURIZED GAS CONTACT WITH DRILLING LIQUID
206	WITH ABOVE-GROUND MEANS FOR PREPARING OR SEPARATING DRILLING FLUID CONSTITUENTS
207	WITH ABOVE-GROUND MEANS FOR HANDLING DRILLING FLUID OR CUTTING
208	. Fluid spray
209	 Fluid or cuttings directing or receiving means engaging bore entrance
210	Anchored to bore wall
211	Axially supported by tool shaft

212	. Pressurized gas supply
213	. With suction pump inlet communicating with bore bottom
214	. Fluid head on tool shaft having lateral port and axial passage with seal for means reciprocable in the head
215	. With tool shaft having plural passages for drilling fluid
216	. Standpipe
217	. With pump
218	. With valve
219	WITH PARTICULAR ACCOMMODATION FOR PERSONNEL (E.G., SEAT OR PROTECTOR)
220	WITH ABOVE-GROUND GUIDE FOR RELATIVELY ADVANCING TOOL
226	WITH SAMPLE COVERING OR COATING MEANS (1) DISPENSED INTO SAMPLE RECEIVER, OR (2) FLUENT
227	WITH STORAGE MEANS FOR BIT LUBRICANT CARRIED BY BIT OR SHAFT
228	. With fluid pressure-actuated feed means
229	. Rotation of bit actuates lubricant feed means
230	WITH EXPANSIBLE BORE WALL ANCHOR (E.G., PACKER)
231	WITH MEANS MOVABLE RELATIVE TO TOOL BELOW GROUND TO CONTROL ECCENTRIC FLUID EMISSION
232	WITH MEANS MOVABLE RELATIVE TO TOOL BELOW GROUND TO STOP FLOW TOWARD BORE BOTTOM
233	. Movable to seal sample receiver at bore bottom pressure
234	. With longitudinally spaced valve seats
235	Seat engaged to stop upward flow
236	. In sample receiver removable through below- ground tool shaft
237	. Means comprises dropped element
238	. Flow-stopping means includes relatively movable cutter element
239	. With undisturbed core receiver
240	Movable means adapted to underlie severed core
241	. Stops flow by movement about fixed pivot
242	Pivot transverse to tool axis
243	. Resiliently biased or composed of flexible material
244	WITH MEANS MOVABLE RELATIVE TO TOOL TO RECEIVE, RETAIN, OR SEVER UNDISTURBED CORE
245	. Core bit closure relative upwardly movable by core
246	Pagainar ramouphla through balaw around tool
	. Receiver removable through below-ground tool shaft With fluid pressure-responsive means to remove

248	Core forming cutting edge or element on receiver
249	. Core-retaining or severing means
250	. Fluid-actuated
251	Actuated upon relative movement between tool
231	and tool shaft
252	Relative rotary movement
253	With element holding retaining or severing means inactive
254	Mounted on transverse pivot
255	Sliding wedge type (e.g., slips)
256	WITH RELEASABLE MEANS NORMALLY HOLDING JOINTED SHAFT SECTIONS IN ANGULAR RELATION
257	TOOL REMOVABLE OR INSERTABLE THROUGH OR AROUND DRIVING OR DRIVEN SHAFT OR CASING
258	. Laterally shiftable cutter element movable
	through shaft
259	Plural cutter elements longitudinally relatively
	movable into transverse alignment
260	Cutter element engages torque transmitting
	abutment on shaft when expanded
261	With additional torque transmitting abutment- on bit head and shaft
262	. Tool movable exteriorly of shaft
263	CUTTER ELEMENT LATERALLY SHIFTABLE BELOW GROUND (E.G., EXPANSIBLE)
264	. With separable means holding tool collapsed
	above ground only
265	. Plural cutter elements longitudinally relative
	movable into transverse alignment
266	. Plural selectively shiftable cutter elements
271	. With latch operated by fluid pressure or dropped element
267	. Cutter element shifted by fluid pressure
268	With dropped element
269	Fluid pressure acts against spring biased part
270	. Cutter element shifted by dropped element
272	 Cutter element shifted by relatively longitudinally movable threaded elements
273	. Cutter element shifted by cam or gear axially rotatable relative to shaft
274	. With shifting mechanism spring biased to operative position
275	With separate latch
276	Frangible or discardable element
277	Latch holds mechanism retracted
278	Latch return shifting mechanism to
-	inoperative position
279	Cam or gear means movable to shift cutter element
280	With forwardly extending noncutting portion

281	Cutter element substantially longitudinally movable on shaft
282	Plural elements expanded into single socket
283	With forwardly extending noncutting portion
284	 Cutter element shifted by longitudinally relatively movable parts
285	Toggle or linkage between movable parts
286	Cam or gear engaging cutter element
287	With separate latch holding cutter element in shifted position
288	Cutter element substantially longitudinally movable on shaft
289	Cutter element spring biased to retracted position
290	. With latch
291	. Spring biased
292	. Pivoted about substantially longitudinal axis
293	BELOW-GROUND (1) HAMMER, OR (2) IMPACT MEMBERS
294	. Combined with safety joint
295	. With noncutting portion forwardly of sleeve impact member having a cutting portion (e.g., reamer)
296	. Fluid-operated
297	 Restricted orifice for initially delaying escape of restraining fluid
298	. Continuous unidirectional rotary motion of one telescoping member effects consecutive impacts
299	. Resiliently biased
300	. With releasable means to detachably retain telescoping members against axial reciprocation
301	Frangible
302	Condition for release adjustable
303	Adjustable below ground
304	Resiliently biased latch
305	. Telescoping members relatively rotatable
306	With means to couple members to prevent relative rotation
307	WITH CUTTING EDGE COVER
308	WITH RECEPTACLE
309	 Removable or insertable through below-ground tool shaft
310	. With helical conveyer
311	. Suspended below bit
312	. Sieve or strainer
313	WITH MECHANICAL CLEANER FOR BIT OR CUTTER ELEMENT
314	WITH WELL-TYPE SCREEN
315	COMBINED
316	WITH RELATIVELY MOVABLE PARTS TO FACILITATE CLEANING WITHOUT DISASSEMBLY
317	WITH MEANS MOVABLE RELATIVE TO TOOL OR SHAFT TO CONTROL BELOW-GROUND PASSAGE

318	. Valve prevents upward flow
319	BELOW-GROUND MECHANICAL MOTION CONVERTING MEANS RELATIVELY MOVING PLURAL CUTTING EDGES
320	WITH TOOL SHAFT DETAIL
321	. Axially telescoping shaft section
322	. Telescoping motion related to relative axial
022	rotation or oscillation
323	. Helix or helically arranged structure
324	. Means other than tool structure to induce fluent flow
325.1	. Shaft carried guide or protector
325.2	Coupled between shaft sections or bit and shaft section
325.3	With bore wall engaging means rotatable relative to shaft section (e.g., with bearings)
325.4	Having removable inserts
325.5	Surrounding existing shaft section
325.6	Held by a fastener parallel to shaft axis
325.7	Held by discrete fastening means tangential to shaft axis
326	Engaging means advances in adjacent hole
327	BIT OR BIT ELEMENT
331	. Rolling cutter bit or rolling cutter bit element
332	Core forming-type bit
333	With core-breaking means
334	Bit with leading cutter forming smaller diameter initial bore
335	Leading fixed cutter
336	Rolling cutter bit with fixed cutter
337	With drilling fluid supply to bearing
338	With rotary or endless carrier
339	With drilling fluid conduit details
340	Fluid conduit lining or element (e.g., slush tube or nozzle)
341	Plural rolling cutters with intermeshing teeth
342	Adjustable cutter element
343	Wobbling cutter
344	Noncutting portion forwardly of rolling cutter (e.g., reamer)
345	Longitudinal axis cutter
346	Separable support for cutter axle
347	Removable axle or bushing
348	Longitudinal axis cutter
349	With transverse axis cutter
350	Laterally offset cutter axis
351	Disk blade
352	Plural coaxial cutters
353	Cone or frustum rolling cutter
354	Axle rotatable with cutter
355	Circumferentially displaced cutter axes

356	Stub axle only
357	Detachable multiaxis support or spider
358	Mutually contacting cutter supports
359	With bearing or seal details
360	Cross axle with stub axle
361	Cross axle
362	Vertically disaligned cross axle sections
363	Separable supports
364	Removable cross axle or bushing
365	Outwardly directed stub axle
366	Separable support for stub axle
367	Detachable stub axle, bushing or bearing
368	Releasable cutter securing device
369	Stub axle cutter securing means
370	Released by antifriction bearing disassembly
371	With bearing or seal details
372	Antifriction type
373	Disk cutter
374	Specific or diverse material
375	Welded
376	Nonsymmetrical bit (e.g., nontracking)
377	Spiral rib or tooth row
378	Irregular tooth cutter row
379	. Cutting edge self-renewable during operation
380	. Unsupported abrading particle type (e.g., shot)
381	. Cutting edges relatively longitudinally movable during operation
382	. Adjustable cutter element
383	Adjustment presents different cutting edge
384	Radially adjustable
385	. Bit with leading portion (e.g., pilot) forming smaller diameter initial bore
386	Leading portion is separable starter
387	Leading portion is core forming type
388	Leading portion is a screw
389	Impact type
390	Plural larger diameter steps
391	Plural larger diameter steps
392	Leading portion is forked rotary type
393	. With fluid conduit lining or element (e.g., slush tube)
394	. With helical-conveying portion
395	Impact type
396	 Axially parallel side wall with transverse cuttings retaining portion
397	. Forked rotary nontracking
398	. Nonsymmetrical bit
399	With bore wall engaging guide
400	Nonsymmetrical arrangement of opening for cuttings or fluid

401	. Cutting edges facing in opposite axial directions
402	. Casing shoe type
403	. Core forming type
404	With core-breaking means
405	Impact or percussion type
405.1	Includes diamond
406	 Noncutting portion forwardly of cutting portion (e.g., reamer)
407	Impact type
408	. With bit guide or bore wall compacting device
412	. Plural separable cutter elements
413	Independently attachable
414	. Impact or percussion type
415	Combined with rotary
416	Noncircular bore cutter
417	With internal-fluid passage
418	Plural openings
419	Cruciform
420	Cruciform
420.1	Insert
420.2	Includes diamond
421	. Symmetrical forked rotary type (e.g., fishtail)
328	. Magnetized or with magnet
425	. Specific or diverse material
426	Insert
427	For a mine roof drill bit type
428	Preformed cutting element (e.g., compact) mounted on a distinct support (e.g., blank, stud, shank)
429	Including a nozzle
430	Having a noncircular or nonplanar cutting face
431	Having a particular orientation or location
432	With support detail
433	Having a specified thermal property
434	Diamond
435	Welded, brazed, or soldered
424	MISCELLANEOUS (E.G., EARTH-BORING NOZZLE)
423	WEDGING SLIP ASSEMBLY FOR SUPPORTING A

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